REMARKS/ARGUMENTS

Claims 1-4, 6, 8, 10, and 12-22 are pending. Claim 1 has been revised to further limit the viscosity range and to incorporate limitations on the macromolecular material from Claim 7. Support for the recited viscosity range is found in the specification on page 35, see Examples 4 and 7. The viscosity range in Claim 10 has been amended consistently with that in Claim 1. The preambles of Claims 12-15 have been revised for clarity and to remove extraneous language. Claim 16 tracks the limitations in Claim 1, but also includes the explicit limitation that the electrolyte is non-polymerized. Such a nonpolymerized nonaqueous liquid electrolyte is exemplified on page 34, first paragraph, of the specification. Claim 17 tracks Claim 10. Claim 18 finds support at page 10, lines 8-20 and Claims 19-21 find support on pages 35-37 of the specification. Claim 22 tracks the limitations in Claim 16 and finds support at least in Example 1, specification pages 32-*et seq*. Accordingly, the Applicants do not believe that any new matter has been added.

The Applicants thank Examiner Weiner for the discussion on July 11, 2005. It was suggested that the Applicants either appeal the final rejection, or file an RCE to obtain consideration of additional amendments.

Rejection—35 U.S.C. §102

Claim 1 was rejected under 35 U.S.C. 102(b) as being anticipated by Kolb, et al., U.S. Patent No. 6,080,282. This rejection is moot in view of the further limitation of Claim 1 to include limitations from Claim 7 regarding the macromolecular material.

Kolb is directed to thermoset gel electrolytes, see col. 2, lines 13-21, which indicates that "The present invention is directed to an electrolytic solution for use as a thermoset gel electrolyte in an electrolytic cell." However, the pending claims are directed to a "liquid

electrolyte". Gels and liquids, even highly viscous liquids, have distinct physical properties. Moreover, the gel electrolytes of Kolb are crosslinked.

A gel is a distinct solid-state physical form because gel has no viscosity, but is itself a self-supporting structure having compression strength. On the other hand, while a liquid has viscosity, it has no mechanical strength.

While Kolb, col. 7, lines 16-29, discloses two PMMAs which are solutions which have viscosities of 2733 or 1742 cps, in Kolb a hardening agent (PHOTOMER or DAROCUR), col. 6, line 3-col. 7, line 10, is added to set the solutions to gel. This is shown in the exemplary formulations in Table 1 (col. 6) of Kolb, which each contain a hardening agent such as PHOTOMER 4050, PHOTOMER 4158 or DAROCUR 1173. Table 2 of Kolb (col. 6) shows the compression strength of each gel sample. Clearly Kolb refers to gels having mechanical or compression strength and not to liquids which do not.

The differences between the liquid electrolyte of the present invention and the thermoset polymerized gel electrolyte of Kolb are also more evident from the following excerpt (Kolb, col. 2, line 59-col. 3, line 3):

> The present invention is also directed to a process for making a thermoset polymer gel electrolyte for use in an electrolytic cell. Initially, the above described electrolytic solution is formed. This electrolytic solution is then applied by an electrolyte applicator onto a first electrode material. After application, the electrolyte and first electrode may be cured by conventional techniques such as heat, light, IR radiation or UV radiation. The polymerizable portion of the applied electrolytic solution is polymerized, thus forming a thermoset electrolyte gel. Notably, the reinforcement polymer (PMMA) is not polymerized, thus remaining in solution in the structure of the electrolytic gel.
>
> Next, a second electrode material is applied onto the electrolyte gel. If the electrolyte is only partially cured, the electrolytic cell components would be subjected to further curing. Finally, the fabricated electrolytic cell, comprising a first electrode, a first active material, an electrolyte gel, a second electrode, and a second active material is collected for storage and/or use.
>
> The thermoset electrolyte gel of the current invention shows increased mechanical properties over prior thermoset electrolyte gels. In particular, the current electrolyte gel shows increased compressive

strength, and a relative low compressive modulus, relative to such prior art electrolytes.

Unlike the liquid electrolyte of the invention, the Kolb electrolyte is polymerized and cured to form a thermoset electrolyte gel having increased mechanical properties, notably increased compressive strength. Accordingly, in view of the structural and functional differences between the prior art polymerized thermoset gel and the liquid electrolyte of the present invention, the Applicants respectfully request that this rejection be withdrawn.

Rejection—35 U.S.C. §103

Claims 2-4 and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kolb, et al., U.S. Patent No. 6,080,282. As discussed above, Kolb is directed to a polymerized thermoset gel electrolyte which is structurally distinct from the liquid electrode of the present invention.

There is no suggestion in Kolb for a liquid electrolyte having a viscosity of 60 cP to 30,000 cP formulated for use in a secondary battery. While Kolb, col. 3, line 44, refers to a "polymerizable" (not polymerized) electrolytic solution which contains solvent, monomer, polymerization initiator, and ionic conductor, this polymerizable solution is not formulated as a liquid electrolyte, since it contains a polymerization initiator.

Moreover, there is no suggestion or reasonable expectation of success in Kolb for the liquid electrolytes of the present invention which exhibit superior properties to prior art polymerized or gel electrolytes including reduced leakage (page 37, lines 9-10), reduced battery deformation (Table 2, page 40) and increased capacity retention (Table 1, page 37).

Accordingly, in view of the structural and functional differences between the prior art polymerized thermoset gel of Kolb and the liquid electrolyte of the present invention, and in

view of the superior properties provided by the liquid electrolytes of the present invention, the Applicants respectfully request that this rejection be withdrawn.

Rejection—35 U.S.C. §103

Claims 7, 8, 10, and 12-15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kolb, et al., U.S. Patent No. 6,080,282, in view of Sasaki et al., U.S. Patent No. 5,556,721. As discussed above, Kolb is directed to a polymerized thermoset gel electrolyte which is structurally distinct from the liquid electrode of the present invention. Sasaki has been applied as a secondary reference disclosing various battery elements (e.g., negative electrode, positive electrode, nonaqueous electrolyte) and various organic solvents (e.g., gamma-butyrolactone). However, there is no suggestion in Kolb or in Sasaki for a liquid electrolyte having a viscosity of 60 cP to 30,000 cP or reasonable expectation of success for the benefits of such an electrolyte as described in the present specification.

Accordingly, in view of the physical and structural differences between the prior art polymerized thermoset gel of Kolb and the liquid electrolyte of the present invention, and in view of the superior properties exhibited by the liquid electrolytes of the present invention, the Applicants respectfully request that this rejection be withdrawn.

CONCLUSION

In view of the above amendments and remarks, the Applicants respectfully request reconsideration of the rejections of record and submit that this application is now in condition for allowance. Early notification to that effect is earnestly solicited.

Respectfully submitted,

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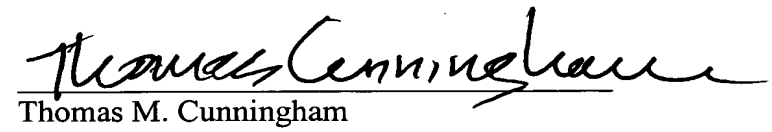

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